

APPENDIX 1

CLEAN COPY OF THE AMENDED PARAGRAPHS

On page 2, at lines 3-19, the paragraph now reads as follows:

Distributed networks of components are used throughout buildings and campuses, and are vital for carrying materials throughout a facility. When buildings are built, wires must be run to connect power outlets to an external power source, and air conditioning or heating ducts must be installed throughout a facility or campus. These distributed networks of components generally distribute air, fluids, or in the case of a communication or power network, electrons, throughout a building or campus. Wireless communication networks distribute radio or optical waves to provide coverage. When deploying a distributed network of components within buildings, or between buildings, or within urban or suburban cores, it is often difficult to locate the physical location and actual installed components that comprise such distributed networks after the building or core is completely built, and field measurements must be conducted to determine suitability, quality, or proper performance of the "hidden" network. Such distributed networks are vital for the operation of any building or campus or urban area, and may include passive or active components that require power or which provide control signals, and which may be in plain sight or may be hidden underground, behind walls, located in raised ceilings, etc.

In the paragraph bridging pages 4 and 5 of the application, beginning on page 4, line 27, and ending on page 5, line 10, the paragraph now reads as follows:

Packet switched networks are another type of data communication networks in which all data are transmitted as many, small chunks of data bits called packets and sent individually from one location to another. A **packet** is a self-contained portion of a full message that is made up of a header, data bits, and sometimes a footer. The

packet contains information in the header and footer that allows the data communications network to properly transmit the packet and to know which message the data in the packet belongs to. Packet switched networks are classified as connection oriented or connectionless depending on how the packets are transferred. In **connection-oriented** networks, a network channel is used which is predefined for each transmission, whereas, in **connectionless** networks, packets are sent simultaneously on a shared channel in multiple transmissions. In this case, packets require an identifier that gives the address of the receiver. This address is understood by the communications network to allow the packet to be properly sent to the correct receiver. Since each packet can be transmitted separately and thus interleaved in time with packets from other transmissions, it is generally more efficient to use a connectionless transmission method when using shared network resources.

On page 5, lines 21-30, the paragraph now reads as follows:

All communication networks utilize some form of communication protocol to regulate the transmission and reception of information. A protocol is the set of rules that all hardware and software on a communication network must follow to allow proper communication of data to take place. Many hundreds of protocols are in active use today in the worldwide exchange of information. Some of these protocols, such as the Internet Protocol (IP), Transport Control Protocol (TCP) or the User Datagram Protocol (UDP), define the way in which the network is accessed. Other protocols, such as the Internet Protocol (IP), Ping, Hypertext Transfer Protocol (HTTP), the File Transfer Protocol (FTP), or simple network management protocol (SNMP), etc., also define how messages and packets are formatted, transmitted, and received.

On page 8, lines 13-30, the paragraph now reads follows:

Several terms are used to quantify the delay times of certain network events

and may be expressed in time units of seconds. **Packet latency** is the time required to send a packet from transmitter to receiver, while **Round Trip Time (RTT)** is the time required for a packet to be sent from transmitter to receiver and for some sort of acknowledgement to be returned from the receiver to the original transmitter. Propagation delay, transmission delay, processing delay, and queuing delay describe the time required for different portions of a packet transmission to occur. The packet latency and round trip time of a network connection is found by summing the propagation delay, transmission delay, processing delay and queuing delay of either a one way or round trip network connection. **Propagation delay** is the time required for a packet to traverse a physical distance from the transmitter to the receiver. **Transmission delay** is the time required from when the first bit of a packet arrives until the last bit of the same packet arrives. **Processing delay** refers to the time required to subdivide a data message into the individual packets at the transmitter, and to the time required to recreate the full data message from the data packets at the receiver. **Queuing delay** refers to the time spent waiting for shared resources to be freed from use by other transmissions. These delay times are all useful for evaluating different aspects of a data communications network performance.

In the paragraph bridging pages 32 and 33 of the application, beginning on page 32, line 31, and ending on page 33, line 5, the paragraph now reads as follows:

Referring to Figure 7, there is shown one possible configuration of the present invention. The invention is a software application that executes on a computer platform 701, an example of such as shown in Figure 2. Typically, the computer platform is small, lightweight, and portable, such as a laptop, pen computer, pocket PC, or Palm Pilot. However, any computing platform such as mainframe computers, a distributed network of computers, large display consoles, or any other computer or computing device could host the invention.

On page 34, at lines 3 to 27, the text now reads as follows:

Using a computer input device, the user may select commands within the graphical window to open one or more computer files that contain one or more sets of textual strings and/or graphical icons that are to be associated with measured data readings 802. Note that these icons or textual strings may be displayed and stored to offer the user a selectable choice of the type of measurement to be performed, and/or to signify the location or position of the measurement, and/or to represent quality measures or measured performance metrics to associate with the actual measurement reading, and/or a convenient display to signify a particular reading or quality metric. The preferred format of the computer file containing the various icons and text strings available for selection by the user is given in Figure 3.

The invention then establishes a connection with the connected measurement device 803 which may be capable of making many different types of measurements (e.g. RSSI, Ec/Io, Throughput, etc.). Note that in the case where a quality or quantity is to be assessed (e.g., paint appearance or proper furnishings) by the surveying personnel for input by keyboard or graffiti text, then no connection to a measurement device would be required since the quality measure or performance metric data is being measured manually by the user and needs to be inputted by the user. The invention establishes a connection between the computing platform and the connected measurement device 803, and the method and format of establishing such connection (i.e., the communication protocol, physical hardware enabling the connection, etc.) will vary depending on the type of measurement device that is connected. The connecting step can apply to any type of measurement device that is capable of communicating with a computing platform either through a direct or remote data connection of some type. A plurality of measurement devices (tools) may also be connected to the computing platform and used by the invention.

On page 35, at lines 11 to 28, the text now reads as follows:

Using the computing platform input device, the user may select one or more textual strings and/or graphical icons using pull-down lists provided by the invention 804. In the preferred embodiment of the invention, the textual strings and/or graphical icons for selection are displayed as shown in Figure 6. At any point, the user may elect to store the currently displayed measured performance metrics (or the person's manual measurements or observations (e.g., paint quality)) into a computer file 805. This occurs by using the computing platform input device to select the appropriate command within the application window.

In the preferred embodiment of the invention, this occurs by selecting the "Save Data" button as shown in Figure 6. When this occurs, the currently displayed measured performance metrics along with the currently selected textual strings and/or graphical icons are appended onto a computer file 806. The format of this file as used within the preferred embodiment of the invention is shown in Figure 5. Other computer file formats could be used within the scope of the same invention. This process then repeats as many times as the user desires 807 during the survey or until the user exits the application. Note that the icons or strings may map to signify interpretations of particular observed measurement readings, and/or to the type of measurement desired, and/or to the location or position of the measurement, as explained above.

On page 39, at lines 11-26, the paragraph now reads as follows:

In addition, if the computer representation of the environment contains textual labels 906 that denote rooms, streets, or other identifiable locations, the label itself may be used as an identifier of where measurement readings should be displayed. That is, measurement readings with associated textual strings that are equivalent to textual labels contained within the computer representation of the environment may be automatically displayed at the location of the textual label within the computer environment. For example, referring to Figure 9, if any measurement reading is

associated with the textual string "COUNSELING ROOM 101D", it may be automatically displayed at location 906 within the computer representation shown in Figure 9 because there is an equivalent textual label at that location. Within the present invention, the associations between textual labels and/or graphical icons and various locations and regions within the computer representation of the environment can be edited and changed at any time. This provides tremendous flexibility to the user, who is now able to completely control the site-specific display of collected measurement readings even though the readings themselves do not contain absolute positioning information such as a latitude-longitude coordinates, XY coordinates or X,Y,Z coordinates.

On page 40, at lines 8 to 32, the paragraph now reads as follows:

Once locations and regions within the computer representation of the environment have been identified, the present invention provides a method and mechanisms to read the stored computer measurement file from step 806 of Figure 8 and use the associated textual strings and/or graphical icons at each measurement reading to position, embed within, and/or display the measurement readings so they appear as overlaid on the computer representation of the environment. Alternatively, the measurement readings and/or the strings or icons may be kept in separate files and not embedded in the environmental model. Referring to Figure 11, there is shown a computer representation of an environment 901 identical to that of Figure 9. Using the associations identified between the locations and regions marked in Figure 9 and various textual strings and/or graphical icons, a measurement data file is imported using the invention, and its contents may be displayed. The display of the measurement readings may take many forms. The preferred embodiment of the invention can display numeric measured data readings, such as RSSI, SNR, SIR, E_c/I_o , number of retries, throughput, bandwidth, quality of service, bit error rate, packet error rate, frame error rate, dropped packet rate, packet latency, round trip

time, propagation delay, transmission delay, processing delay, queuing delay, network capacity, packet jitter, bandwidth delay product and handoff delay time, as textual strings, or circular, spherical, or cylindrical regions of varying color and/or size depending on selected settings. Associated textual strings and/or graphical icons and other assorted measurement information, such as notes, measurement sequence number, and date and time can also be displayed or stored. It should be clear that the invention may also be applied to a myriad of measurement or manual observation applications involving field surveys, such as for real estate applications, heating and air-conditioning, and other areas as described above.

On page 41, at lines 1-18, the paragraph now reads as follows:

For example, referring to Figure 11, graphical icons that are smiley faces may have been associated by the user (or some other programmer) with the rectangular region 902. In this case, the present invention determines that both the measurement reading and the rectangular region 902 are associated with the smiley face icon. The invention then displays the measurement data reading within the region identified by the rectangular region 902. In Figure 11, the selected setting is to display the graphical icon itself 1101. Measurement readings whose associated textual strings and/or graphical icons match those assigned to the circular region 904 have now had a particular measured value displayed as a textual string 1102. In this case, the “2 Mbps” actual measured throughput reading has been displayed 1102. Measurement readings whose associated textual strings and/or graphical icons match those assigned to the selected point 905 have had a particular measured value displayed as a circular area of color 1103, where the radius and color of the circle correspond to some user determined range for the selected value. Measurement readings that are associated with the “COUNSELING ROOM 101D” textual string have had a particular measured value displayed as a circular area of color 1104 at the same position as the “COUNSELING ROOM 101D” textual label 906. As 3-D displays become popular, it